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USE IN COSMETIC COMPOSITIONS OF AMPHOTERIC SURFACE-ACTIVE AGENTS FOR PRECIPITATING CATIONIC POLYMERS IN THE DILUTED STATE

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(57) Abstract

The invention relates to the use of at least one amphoteric surface-active agent in transparent aqueous cosmetic compositions for the hair and/or skin designed to be rinsed, comprising at least one anionic surface-active agent, at least one surface-active agent selected from the betaines and at least one water-soluble or water-dispersible cationic polymer derived from a polysaccharide (PolC), as precipitant, in the diluted state, of said cationic polymer (PolC). The invention further relates to transparent aqueous cosmetic compositions for the hair and/or skin designed to be rinsed, comprising at least one anionic surface-active agent, at least one surface-active agent selected from the betaines, at least one water-soluble or water-dispersible cationic polymer derived from a polysaccharide (PolC) and at least one amphoteric surface-active agent.

The present invention has as its subject the use in transparent aqueous cosmetic compositions designed to be rinsed of at least one amphoteric surface-active agent as precipitating agent upon dilution during application of said compositions on the hair and/or skin, of water-soluble or water-dispersible cationic polymers derived from polysaccharides (especially the cationic celluloses and hydroxylated cationic guar) included in said compositions; it also has as its subject aqueous cosmetic compositions for the hair and/or skin containing, besides said amphoteric surface-active agent, at least one anionic surface-active agent, at least one

surface-active agent chosen from the betaines and at least one water-soluble cationic polymer derived from a polysaccharide.

The hair or the human body gets dirty with contact of atmospheric pollution and to a greater extent by natural secretions such as sebum. This phenomenon requires frequent cleansing of the skin and hair with the aid of cosmetic compositions. While the detergent properties of the latter often prove to be broadly satisfactory, frequent and repeated washings nevertheless have the effect of leaving the hair in a state that requires additional treatment. Different solutions have been proposed to remedy this problem, going from the use of conditioning agents included in the cosmetic formulation to the development of specific products used in aftertreatment.

For reasons of cost and effectiveness, maximizing the deposit of conditioning agents on the hair and/or skin is sought. A general approach consists of using the associative interactions between an anionic surface-active agent and a cationic polymer, interactions leading to the precipitation of a surface-active agent/polymer complex on the required surface. By way of example, formulations can be mentioned that are based on the sodium lauryl ether sulfate/cocamidopropyl betaine and hydroxypropyl guar trimonium chloride system such as Jaguar C13S marketed by the Rhône-Poulenc Company. This system precipitates with dilution by phase separation, leading to an increased deposit of polymer on the surface of the hair and/or skin. However, this system does not make it possible to obtain formulations with the required transparency.

A solution to improve the transparency consists of using, as cationic guar, the hydroxypropyl guar hydroxypropyltrimonium chloride such as Jaguar C162 marketed by the Rhône-Poulenc Company, but the system formed by combination with the previously mentioned surface-active agents does not precipitate with dilution.

The applicant has unexpectedly found that the addition of a small amount of an amphoteric surface-active agent to a transparent aqueous medium containing an anionic surface-active agent, a betaine-type surface-active agent and a water-soluble or water-dispersible cationic polymer derived from a polysaccharide that, upon dilution, does not precipitate by phase separation (especially cationic celluloses and hydroxylated cationic guar) makes it possible to obtain, upon dilution, the precipitation of said cationic polymer by a phase-separation phenomenon.

In cosmetic application, this precipitation causes a great increase in the deposit of cationic polymer derived from polysaccharide on the hair and/or skin when said aqueous medium is diluted by contact with the moistened or wet hair and/or the skin.

At the same time this system can also be used to increase the deposit of water-insoluble organic cosmetic agents that can be present in the form of dispersions of particles.

The present invention has as a first subject the use in transparent aqueous cosmetic compositions for the hair and/or skin desired to be rinsed of at least one amphoteric surface-active agent (A) in an amount on the order of 0.5 to 10 wt%, preferably on the order of 0.5 to 3 wt% by comparison with the weight of said cosmetic compositions, as precipitating agent, upon dilution during the application of said compositions on the hair and/or skin, of water-soluble or water-dispersible cationic polymers derived from a polysaccharide (CPol), said transparent aqueous cosmetic compositions containing at least 90% of their weight as an aqueous phase (Φ) containing 8 to 20 wt% from a system(s) formed of at least one anionic surface-active agent (SAn), of at least one surface-active agent chosen from the betaines (SB) and of at least one water-soluble or water-dispersible cationic polymers derived from a polysaccharide (CPol), the respective amounts of the constituents (SAn), (SB) and (CPol) and the nature of the cationic polymer (CPol) in said system (S) being such that the aqueous phase (ϕ) formed from said system (S) in aqueous solution at a concentration from 8 to 20% has a transmittance at least equal to 90% when measured at 600 nm and does not present any phase-separation behavior with formation of precipitate upon dilution.

According to the invention, the aqueous phase (ϕ) formed of said system (S) in aqueous solution at a concentration of 8 to 20% does not present phase-separation behavior with formation of a precipitate upon dilution, this same aqueous phase (ϕ) presenting, upon dilution, in the presence of the amphoteric surface-active agent (A), a phase-separation behavior with formation of a precipitate.

This phenomenon of phase separation by dilution takes place or is manifested during the use of said cosmetic composition by contact on the surface to be treated (hair and/or skin), a surface that already presents a relatively high degree of hydration (for example, wet hair, moistened skin).

In the case of a shampoo, for example, the dilution factor of the cosmetic composition

during its application can be evaluated at a value on the order of 3 to 10, considering that a gram of wet hair retains on average 0.6 to 1 g of water, and that 0.1 g of shampoo is usually applied per gram of hair expressed as dry, generally with a duration of application of 30 to 45 sec.

After having been applied, the cosmetic composition must then be rinsed to eliminate the excess surface-active agents.

For good execution of the invention, said aqueous phase (Φ) contains:

- on the order of 5 to 15 wt%, preferably on the order of 8 to 12 wt%, of at least one anionic surface-active agent (SAn)
- on the order of 0.5 to 10 wt%, preferably on the order of 0.5 to 3 wt%, of at least one surface-active agent chosen from the betaines (SB)
- and on the order of 0.015 to 2 wt%, preferably on the order of 0.05 to 0.5 wt%, of at least one cationic polymer (CPol).

Among the cationic polymers (CPol) not precipitating upon dilution of the aqueous phase (Φ) in the absence of amphoteric surface-active agent (A) but in the presence of amphoteric surface-active agent (A) presenting a phase-separation behavior with formation of a precipitate, the cationic derivatives of cellulose and the hydroxyalkylated derivatives of cationic guar can especially be mentioned.

Among the preferential polymers, the (C₂-C₂₂) hydroxyalkylated derivatives of cationic guar can be mentioned, such as especially hydroxypropyl guar hydroxypropyltrimonium chloride (Jaguar C162 and Jaguar C2000 marketed by Rhône-Poulenc) and the cationic derivatives of cellulose, such as especially propyl cellulose 2-hydroxy-3-trimethylammonium chloride poly(oxy-1,2-ethanediyl) ether or polyquaternium-10 (Polymer JR400 marketed by Union Carbide).

The cationicity of these polymers is variable: thus, in the case of hydroxypropylated derivatives of cationic guar such as Jaguar C162 and C2000 marketed by the Rhône-Poulenc Company, the degree of hydroxypropylation ("molar substitution" or MS) will be between 0.02 and 1.2 and the degree of cationicity ("degree of substitution" or DS) will be between 0.01 and 0.6. These products can possibly be functionalized by hydrophobic groups such as alkyl chains.

These cationic polymers can possibly be functionalized by anionic groups such as carboxymethyl, sulfate, sulfonate or phosphate groups on the condition that the degree of

--substitution of these anionic groups is in all cases less than the degree of substitution of the cationic groups.

These cationic polymers generally have a molecular weight of at least 2000, more generally on the order of 200,000 to 3,000,000.

Anionic surface-active agents (SAn) capable of being present within the scope of the invention and that can be mentioned are:

alkylester sulfonates with formula $R-CH(SO_3M)-COOR'$ where R represents a C_8-C_{20} alkyl radical, preferably $C_{10}-C_{16}$, R' a C_1-C_6 alkyl radical, preferably C_1-C_3 and M an alkaline cation (sodium, potassium, lithium), ammonium that may or may not be substituted (methyl-, dimethyl-, trimethyl-, tetramethylammonium, dimethylpiperidium...) or derivative of an alkanolamine (monoethanolamine, diethanolamine, triethanolamine...). Very specifically, the methyl ester sulfonates in which the R radical is $C_{14}-C_{16}$ can be mentioned;

alkyl sulfates with the formula $ROSO_3M$, where R represents a $C_{10}-C_{24}$ alkyl or hydroxyalkyl radical, preferably $C_{12}-C_{20}$ and very specifically, $C_{12}-C_{18}$, M represents a hydrogen atom or a cation with the same definition as above, as well as their ethoxylated (EO) and/or propoxylated (PO) derivatives presenting on average 0.5 to 6 units, preferably 0.5 to 3 units of EO and/or PO;

alkylamide sulfates with formula $RCNHR'OSO_3M$ where R represents a C_2-C_{22} alkyl radical, preferably C_6-C_{20} , R' a C_2-C_3 alkyl radical, M representing a hydrogen atom or a cation with the same definition as above, as well as their ethoxylated (EO) and/or propoxylated (PO) derivatives, presenting on average 0.5 to 60 EO and/or PO units;

salts of saturated or unsaturated C_8-C_{24} fatty acids, preferably $C_{14}-C_{20}$, C_9-C_{20} alkylbenzenesulfonates, primary or secondary C_8-C_{22} alkylsulfonates, alkylglycerol sulfonates, sulfonated polycarboxylic acids described in GB-A-1 082 179, paraffin sulfonates, N-acyl N-alkyltaurates, alkylphosphates, alkylisethionates, alkylsuccinamates, alkylsulfosuccinates, monoesters or diesters of sulfosuccinates, N-acylsarcosinates, sulfates of alkylglycosides, polyethoxycarboxylates

the cation being an alkali metal (sodium, potassium, lithium), a substituted or

unsubstituted ammonium residue (methyl-, dimethyl-, trimethyl-, tetramethylammonium, dimethylpiperidinium...) or derived from an alkanolamine (monoethanolamine, diethanolamine, triethanolamine...);

It is preferred to use the ethoxylated derivatives of fatty acids, in particular the derivatives of lauric acid such as lauryl ether sulfate of sodium, magnesium or their mixtures.

Surface-active agent chosen from the betaines (SB) is understood to be any surface-active agent with a negative charge and a permanent positive charge on the same molecule whatever the pH and not presenting any isoelectric point. It concerns quaternized derivatives.

By way of example, the following can be mentioned:

- betaines with formula

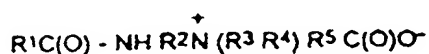


such as lauryl betaine (Mirataine BB from the Rhône-Poulenc Company)

- Sulfobetaines with formula

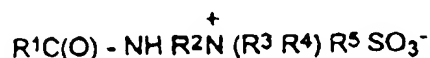


- amidoalkylbetaines with formula



such as cocamidopropyl betaine (Mirataine BDJ from the Rhône-Poulenc Company)

- sulfobetaines with formula



such as cocamidopropyl hydroxy sultaine (Mirataine CBS from the Rhône-Poulenc Company)

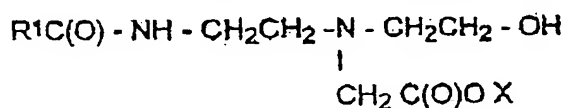
formulas in which the R^1 radicals represent an alkyl or alkenyl radical with 10 to 24 carbon atoms, R^2 , R^3 , R^4 and R^5 , which may be identical or different, represent an alkyl or alkenyl radical with 1 to 4 carbon atoms.

Amphoteric surface-active agent (A) is understood to be any surface-active agent with an

anionic and cationic charge simultaneously, a product in which the degree of ionization varies according to the pH of the medium in which it is found. These products have an isoelectric point (IEP) between 3.5 and 6.5.

By way of examples, the following can be mentioned:

- alkyl or alkenyl amphotacetates or amphodiacetates more generally fulfilling formula:



in which R^1 represents an alkyl or alkenyl radical with 10 to 24 carbon atoms, most often coco and lauryl chains. (Miranol C2M and Miranol C32 from the Rhône-Poulenc Company) and X a hydrogen atom, an alkali or alkaline-earth metal, an amine

* the alkyl amphopropionates or -dipropionates, (Miranol C2M SF from the Rhône-Poulenc Company)

* the alkyl amphohydroxypropyl sultaines (Miranol CS from the Rhône-Poulenc Company)

in which the alkyl groups contain 8 to 24 carbon atoms, and are most often coco or lauryl groups.

According to an embodiment variant of the invention, said amphoteric surface-active agent (A) can also be used to increase the deposit of particles of cosmetically advantageous water-insoluble organic compounds (OPins), during the dilution for use of said cosmetic compositions containing in addition at least an aqueous dispersion of said water-insoluble organic particles.

Said particles can be present in said compositions at the ratio on the order of 0.1 to 10 wt%, preferably on the order of 0.2 to 2 wt%. Their size can be between 0.15 and 70 μm .

Among the cosmetically advantageous insoluble organic compounds (OPins) that may be present in the form of particles in aqueous dispersion in said cosmetic compositions, the water-insoluble and nonvolatile organopolysiloxanes (also called subsequently "water-insoluble and nonvolatile silicones") can be mentioned, among which the polyalkylsiloxane oils, gums or resins, polyarylsiloxanes, polyalkylarylsiloxanes or their functionalized water-insoluble derivatives or their nonvolatile mixtures can be mentioned.

Said organopolysiloxanes are considered to be water-insoluble and nonvolatile when

their solubility in water is less than 50 g/L and their intrinsic viscosity at least 3000 mPa·s at 25°C.

By way of more specific examples of organopolysiloxanes or water-insoluble and nonvolatile silicones, silicone gums can be mentioned, for example diphenyl dimethicone marketed by the Rhône-Poulenc Company and preferably the polydimethylsiloxanes with a viscosity at least equal to 600,000 mPa·s at 25°C, and still more preferentially, those with a viscosity greater than 2,000,000 mPa·s at 25°C such as Mirasil DM 500000® marketed by the Rhône-Poulenc Company.

The organopolysiloxane or water-insoluble and nonvolatile silicone is found in dispersed form within the cosmetic composition containing it. This latter is presented in the form of particles, the size of which can be chosen according to the nature of the cosmetic composition or the performance sought for said composition. Generally, this size can vary from 0.02 to 70 µm. Preferentially, this size is on the order of 1 to 80 µm, very specifically on the order of 1 to 30 µm.

These particles of silicones can be formed of a mixture of silicones the presence of which may be due to the method of using the cosmetically advantageous silicone agent within the cosmetic composition. Thus, the cosmetically advantageous organopolysiloxanes can be previously dispersed or solubilized in silicone derivatives with low viscosity, which may or may not be volatile, then emulsified in the cosmetic composition. Among the silicones with low viscosity, the cyclic volatile silicones and the low [molecular] weight polydimethyl siloxanes can be mentioned.

As polyorganosiloxanes, derivatives of functionalized silicones such as amino derivatives such as Mirasil ADM-E marketed by the Rhône-Poulenc Company (used directly in the form of emulsions in the cosmetic composition or from preformed microemulsions) can be mentioned.

As insoluble organic compounds that can be present in the form of particles, oils can be mentioned that exert conditioning, protective, or emollient functions, oils that are generally chosen from: alkylmonoglycerides, alkyldiglycerides, triglycerides such as oils extracted from plants and vegetables (palm, coconut, cottonseed, soybean, sunflower, olive, grapeseed, sesame, peanut, castor oils ...) or oils of animal origin (tallow, fish oils...), derivatives of these oils such as hydrogenated oils, derivatives of lanolin, mineral oils or paraffin oils, perhydrosqualane,

squalene, diols such as 1,2-dodecanediol, cetyl alcohol, stearyl alcohol, oleyl alcohol, fatty esters such as isopropyl palmitate, ethyl-2-hexyl cocoate, myristyl myristate, esters of lactic acid, stearic acid, behenic acid, isostearic acid.

Particles of bactericidal or fungicidal agents can also be mentioned in order to improve the disinfection of the skin such as for example, triclosan, antidandruff agents such as zinc pyrithione or Octopirox, insecticidal agents such as natural or synthetic pyrethroids. If applicable, these different organic molecules can be previously encapsulated in appropriate matrices according to methods known to the expert. Among these, the encapsulation of organic molecules in polymeric latexes can be mentioned by way of example.

The organic particles insoluble in water can also be formed from agents for the protection of the skin and/or hair from attacks by the sun and UV rays such as sunscreens, which are chemical compounds strongly absorbing UV radiation, such as compounds approved in the European Directive No. 76/768/EEC, its appendixes and later modifications of this directive.

In the case where the cosmetically advantageous insoluble organic compounds have too high a micellar solubility (by comparison with the amount of surface-active agents present) or are present in solid form at ambient temperature, these can be put into solution in an organic vehicle such as mineral or natural oils, silicone derivatives, waxes, or encapsulated in matrices such as polymers (acrylic for example) present in dispersion, for example, in latex form.

A second subject of the invention consists of transparent aqueous cosmetic compositions for the hair and/or skin designed to be rinsed, containing at least 90% of their weight of an aqueous phase (Φ) containing:

- at least one amphoteric surface-active agent in an amount on the order of 0.5 to 10 wt%, preferably on the order of 0.5 to 3 wt% by comparison with the weight of said cosmetic compositions,
- and 8 to 20 wt% from a system (S) formed from at least one anionic surface-active agent (SAn), of at least one surface-active agent chosen from the betaines (SB) and at least one water-soluble or water-dispersible cationic polymer derivative of a polysaccharide (CPol),

the respective amounts of the constituents (SAn), (SB) and (CPol) and the nature of the cationic polymer (CPol) in said system (S) being such that the aqueous phase (ϕ) formed from

said system (S) in aqueous solution at a concentration from 8 to 20% has a transmittance measured at 600 nm at least equal to 90% and does not present any phase-separation behavior with formation of precipitate upon dilution [sic; of] said aqueous phase (ϕ) in the presence of said amphoteric surface-active agent (A) upon dilution, presenting a phase-separation behavior with formation of a precipitate.

For good execution of the invention said aqueous phase (ϕ) contains:

on the order of 5 to 15 wt%, preferably on the order of 8 to 12 wt% of at least one anionic surface-active agent (SAn)

on the order of 0.5 to 10 wt%, preferably on the order of 0.5 to 3 wt% of at least one surface-active agent chosen from the betaines (SB)

and on the order of 0.015 to 2 wt%, preferably on the order of 0.05 to 0.5 wt% of at least one cationic polymer (CPol).

Examples of cationic polymers (CPol), surface-active agents (SAn), (SB) and (A) that can be present in said compositions have already been described above.

The term cosmetic composition or formulation is understood to be all cosmetic products or preparations such as described in appendix 1 ("illustrative list by category of cosmetic products") of the European directive No. 76/768/EEC of July 27, 1976, said cosmetic directive.

The cosmetic compositions that are the subject of the invention can be formulated in a large number of types of products for the skin and/or the hair, gels (styling especially), conditioners, formulations for styling or for facilitating combing the hair, rinsing formulas, lotions for the hands and body, products regulating the moisturizing of the skin, washing milks, makeup-removal compositions, shampoos, shower gels, liquid soaps and even other compositions of the same type.

According to one embodiment variant of the invention, said cosmetic compositions in addition can contain particles of cosmetically advantageous water-insoluble organic compounds (OPins).

Said particles can be present in said compositions at a ratio on the order of 0.1 to 10 wt%, preferably on the order of 0.2 to 2 wt%. Their size can be between 0.15 and 70 μm .

Examples of (OPins) constituents that can be present in said compositions have already been mentioned above.

For good execution of the invention, the cosmetic compositions that are the subject of the invention in addition can include resin fixatives. These resin fixatives are generally present at concentrations between 0.01 and 10%, preferentially between 0.5 and 5%.

These resin fixatives are preferentially chosen from the methyl acrylate/acrylamide copolymers, polyvinyl methyl ether/maleic anhydride copolymers, vinyl acetate/crotonic acid copolymers, octylacrylamide/methyl acrylate/butylaminoethylmethacrylate copolymers, polyvinylpyrrolidones, polyvinylpyrrolidone/methyl methacrylate copolymers, polyvinylpyrrolidone/vinyl acetate copolymers, polyvinyl alcohols, polyvinyl alcohol/crotonic acid copolymers, polyvinyl alcohol/maleic anhydride copolymers, hydroxypropyl celluloses, hydroxypropyl guar, polystyrene sodium sulfonates, polyvinylpyrrolidone/ethyl methacrylate/methacrylic acid terpolymers, poly(methyl vinyl ether/maleic acid) monomethyl ethers, polyvinyl acetates grafted on polyoxyethylenated trunks (EP-A-219,048), copolyester derivatives of terephthalic and/or isophthalic and/or sulfoisophthalic acid, anhydride or diester and a diol such as:

- polyester copolymers based on ethylene terephthalate and /or propylene terephthalate and polyoxyethylene terephthalate (US-A-3 959 230, US-A-3 893 929, US-A-7 116 896, US-A-4 702 857, US-A-4 770 666);
- sulfonated polyester oligomers obtained by sulfonation of an oligomer derivative of ethoxylated allyl alcohol, dimethyl terephthalate and 1,2-propylene diol (US-A-4 968 451)
- polyester copolymers based on propylene terephthalate and polyoxyethylene terephthalate units and terminated by ethyl, methyl units (US-A-4 711 730) or polysulfoethoxy anionic groups (US-A-4 721 580), sulfoaroyls (US-A-4 877 896)
- polyester-polyurethanes obtained by reaction of a polyester obtained from adipic acid and/or terephthalic acid and/or sulfoisophthalic acid and a diol, on a prepolymer with terminal isocyanate groups obtained from a polyoxyethylene glycol and a diisocyanate (FR-A-2 334 698)
- ethoxylated monoamines or polyamines, the polymers of ethoxylated amines (US-A-4 597 898, EP-A-11 984)
- sulfonated polyester oligomers obtained by condensation of isophthalic acid,

dimethyl sulfosuccinate and diethylene glycol (FR-A-2 236 926)

- polyester copolymers, derived from dimethyl terephthalate, isophthalic acid, dimethyl sulfoisophthalate and ethylene glycol (EP-A-540374)
-
- copolymers comprising polyester units, derived from dimethyl terephthalate, isophthalic acid, dimethyl sulfoisophthalate and ethylene glycol and polyorganosiloxane units (FR-A-2 728 915).

Preferentially, the resin fixatives are of the polyvinylpyrrolidone type (PVP), copolymers of polyvinylpyrrolidone and methyl methacrylate, copolymers of polyvinylpyrrolidone and vinyl acetate (VA), polyethylene glycol terephthalate/polyethylene glycol copolymers, polyethylene glycol terephthalate/polyethylene glycol/polyisophthalate sodium sulfonate copolymers and their mixtures.

These resin fixatives are preferentially dispersed or solubilized in the chosen vehicle.

The cosmetic compositions that are the subject of the invention can also contain polymeric derivatives exerting a protective function.

These polymeric derivatives can be present in amounts on the order of 0.01-10%, preferably approximately 0.1-5% and very specifically on the order of 0.2-3 wt%, agents such as:

- cellulose derivatives such as cellulose hydroxyethers, methylcellulose, ethylcellulose, hydroxypropyl methylcellulose, hydroxybutyl methylcellulose
 - polyvinylesters grafted on polyalkylene trunks such as polyvinyl acetates grafted on polyoxyethylenated trunks (EP-A-219 048)
- polyvinyl alcohols

The performances of cosmetic compositions that are the subject of the invention can also be improved by the use of plasticizing agents. The plasticizing agent could form between 0.1 and 10% of the formulation, preferably 1 to 10%. Among the particularly useful plasticizing agents are adipates, phthalates, isophthalates, azelates, stearates, silicone copolyols, glycols, castor oil or their mixtures.

Advantageously, metal sequestering agents can also be added to these compositions, more particularly those sequestering calcium such as citrate ions.

Moisturizing agents can also be included in the cosmetic compositions that are the subject of this invention; glycerol, sorbitol, urea, collagen, gelatin, aloe vera, hyaluronic acid can

be mentioned.

Also, to decrease the irritation and attack of the scalp, water-soluble or water-dispersible polymers can also be added, such as collagen or certain nonallergenic derivatives of animal or plant proteins (hydrolyzates of wheat proteins for example), natural hydrocolloids (guar gum, carob gum, tara gum...) or derived from fermentation procedures and derivatives of these polycarbohydrates such as modified celluloses (for example hydroxyethylcellulose, carboxymethylcellulose), derivatives of guar or carob such as their nonionic derivatives (for example hydroxypropyl guar), anionic derivatives (carboxymethyl guar and carboxymethyl hydroxypropyl guar).

Preservative agents such as methyl, ethyl, propyl and butyl esters of p-hydroxybenzoic acid, sodium benzoate, Germaben (trade name) or any chemical agent preventing bacterial or mold proliferation and traditionally used with cosmetic compositions are generally introduced into these compositions in the vicinity of 0.01 to 3 wt%. The amount of these products is generally adjusted to prevent any proliferation of bacteria, molds or yeasts in the cosmetic compositions.

Alternatively to these chemical agents, agents can sometimes be used that modify the activity of the water and strongly increase the osmotic pressure, such as carbohydrates or salts.

Generally, to increase the pleasure during the use of the composition by the consumer, added to these ingredients are one or more fragrances, coloring agents, among which the products described in appendix IV ("List of coloring agents allowed for use in cosmetic products") of European directive No. 78/768/EEC of July 27, 1976, said cosmetic directive, and/or opacifying agents such as pigments. Fragrances, coloring agents or pigments can be added.

The composition can also contain viscosity-enhancing or gelling agents, such as crosslinked polyacrylates – Carbopol marketed by Goodrich -, the derivatives of cellulose such as hydroxypropyl cellulose, carboxymethylcellulose, guar and their derivatives., used alone or in combination, or even compounds, generally in the form of water-soluble polymers modified by hydrophobic groups bonded covalently to the polymer skeleton as described in the patent WO 92/16187 and/or water to bring the total of the constituents of the formulation to 100%.

The cosmetic compositions that are the subject of the invention can also contain polymeric dispersing agents in a quantity on the order of 0.1-7 wt% to control the hardness of

calcium and magnesium, agents such as:

- the water-soluble salts of polycarboxylic acids with molecular weights on the order of 2000 to 100,000, obtained by polymerization or copolymerization of ethylenically unsaturated carboxylic acids such as acrylic acid, maleic acid or anhydride, fumaric acid, itaconic acid, aconitic acid, mesaconic acid, citraconic acid, methylenemalononic acid and very specifically, the polyacrylates with molecular weights on the order of 2000 to 10,000 (US-A-3 308 067), copolymers of acrylic acid and maleic anhydride with molecular weights on the order of 5000 to 75,000 (EP-A-66 915)
- polyethylene glycols with molecular weights on the order of 1000 to 50,000.

The following examples are given by way of illustration.

Example 1:

The following formulations are prepared traditionally (final pH 6). The amounts are expressed in percentage of active material.

Ingrédients (1)	Nom INCI (2)	Formulation					
		1	2	3	4	5	6
Empicol ESB/3M (3) (% poids)	Sodium lauryl éther (2EO) sulfate (4)	8	8	7	7	8	8
Tegobétaïne L7 (3) (% poids)	Cocamidopropyl bétaine (5)	2	2	2	2	0	0
Miranol Ultra C32 (3) (% poids)	Sodium cocoamphoacétate (6)	0	0	1	1	2	2
Jaguar C162 * (3) (% poids)	hydroxypropyl guar hydroxypropyl trimonium chloride	0.3	0	0.3	0	0.3	0
Jaguar C2000 ** (3) (% poids)	hydroxypropyl guar hydroxypropyl trimonium chloride	0	0.3	0	0.3	0	0.3
(7) eau		qsp 100	qsp 100	qsp 100	qsp 100	qsp 100	qsp 100

	Formulation					
	1	2	3	4	5	6
(8) Transmittance (% à 600 nm)	100	100	100	100	100	100

*Jaguar C162: hydroxypropyl guar hydroxypropyltrimonium chloride
 . content of hydroxypropyl group: 0.6
 . degree of substitution: 0.1

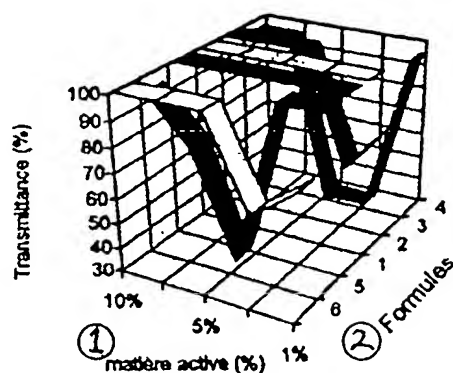
**Jaguar C2000: hydroxypropyl guar hydroxypropyltrimonium chloride

content of hydroxypropyl group: 0.6
degree of substitution: 0.2

Key:	1	Ingredients
	2	INCI [International Nomenclature of Cosmetic Ingredients] name
	3	wt%
	4	Sodium lauryl ether (2EO) sulfate
	5	Cocamidopropyl betaine
	6	Sodium cocamphoacetate
	7	Water
	8	Transmittance (% at 600 nm)

Formulations (formulas) 1 to 6 of the preceding table containing approximately 10 wt% of dry extract are diluted by increasing amounts of water; the transmittance of the diluted formulations is measured by means of a Jasco 7800 spectrophotometer.

The following graph shows the change in transmittance as a function of the concentration of active material.



Key:	1	Active material
	2	Formulas

It is noted that the formulations containing sodium cocoamphoacetate show the presence of a precipitation phenomenon during dilution, whereas the formulations containing only cocamidopropyl betaine remain stable upon dilution.

Example 2:

The following formulations are prepared traditionally (final pH 6). The amounts are expressed in percentage of active material.

Ingrédients ①	Nom INCI ②	Formulations			
		1	3	7	5
Empicol ESB/3M ③ (% poids)	Sodium lauryl ether (2EO) sulfate ④	8	7	7	8
Tegobetaïne L7 (% poids)	Cocamidopropyl bétaine ⑤	2	2	2	0
Miranol CSE (% poids)	Sodium cocoampho hydroxypropyl sulfonate	0	0	1	0
Miranol Ultra C32 (% poids)	Sodium cocoamphoacetate	0	1	0	2
Jaguar C162 (% poids)	hydroxypropyl guar hydroxypropyl trimonium chloride	0.3	0.3	0.3	0.3
Transmittance (%, 500 nm)		100	100	100	100

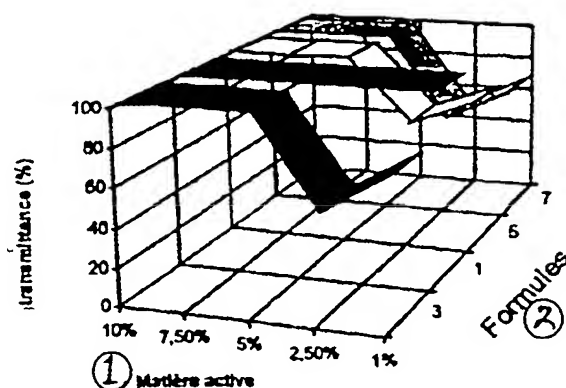
Key: 1 Ingredients
 2 INCI name
 3 wt%
 4 Sodium lauryl ether (2EO) sulfate
 5 Cocamidopropyl betaine

Formulations (formulas) of the preceding table containing approximately 10 wt% of dry extract are diluted by increasing amounts of water; the transmittance of the diluted formulations

is measured by means of a Jasco 7800 spectrophotometer.

The following graph shows the change in transmittance as a function of the concentration of active material.

The following graph shows the change in transmittance as a function of the concentration.



Key: 1 Active material
2 Formulas

The formulations containing amphoteric surface-active agents show the presence of a precipitation phenomenon during dilution. The formulations containing only cocamidopropyl betaine remain stable with dilution.

Example 3:

The following formulations are prepared traditionally (final pH 6). The amounts are expressed in percentage of active material.

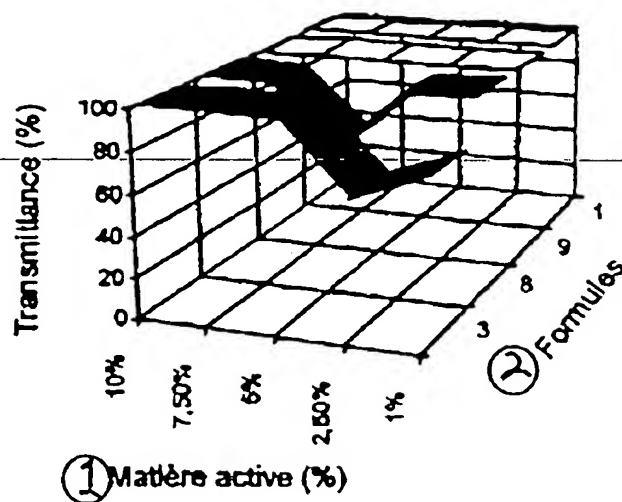
Ingrédients ①	② Nom INCI	Formulation			
		3	8	9	1
Empicol ESB/3M (% poids) ③	④ Sodium lauryl ether (2EO) sulfate	7	7	8	8
Tegobetaine L7 (% poids)	⑤ Cocamidopropyl bétaine	2	2	2	2
Miranol Ultra C32 (% poids)	⑥ Sodium cocoamphoacétate	1	1	0	0
Jaguar C162 (% poids)	hydroxypropyl guar hydroxypropyl trimonium chloride	0.3	0	0.3	0
Polymer JR400 (cellulose cationique) (% poids) ⑦	Polyquaternium 10	0	0.3	0	0.3
Transmittance (%, 600 nm)		100	100	100	100

- Key:
- 1 Ingredients
 - 2 INCI name
 - 3 wt%
 - 4 Sodium lauryl ether (2EO) sulfate
 - 5 Cocamidopropyl betaine
 - 6 Sodium cocamphoacetate
 - 7 (cationic cellulose)

Formulations (formulas) of the preceding table containing approximately 10 wt% of dry extract are diluted by increasing amounts of water; the transmittance of the diluted formulations is measured by means of a Jasco 7800 spectrophotometer.

The following graph shows the change in transmittance as a function of the concentration. of active material.

The following graph shows the change in transmittance as a function of the concentration



Key: 1 Active material (%)
2 Formulas

The presence of amphoteric surface-active agent leads to phenomena of precipitation during dilution.

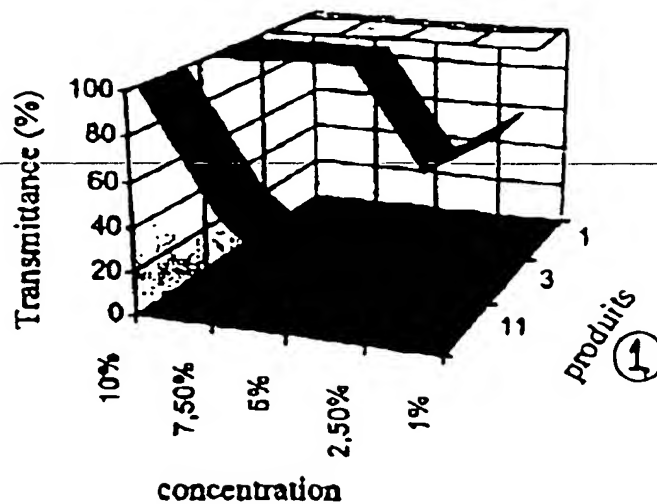
Example 4: Comparative (non-hydroxyalkylated cationic guar)

The following formulations are prepared traditionally (final pH 6). The amounts are expressed in percentage of active material.

Ingédients ①	② Nom INCI	Formulation			
		3.	10	1	11
Empicol ESB/3M (% poids) ③	④ Sodium lauryl éther (2EO) sulfate	7	7	8	8
Tegobétaïne L7 (% poids)	⑤ Cocamidopropyl bétaine	2	2	2	2
Miranol Ultra C32 (% poids)	⑥ Sodium cocoamphoacétate	1	1	0	0
Jaguar C182 (% poids)	hydroxypropyl guar hydroxypropyl trimonium chloride	0.3	0	0.3	0
JAGUAR C13S (% poids)	guar hydroxypropyl trimonium chloride	0	0.3	0	0.3
Transmittance (%, 600 nm)		100	<70	100	<70

-Jaguar C13S: guar hydroxypropyltrimonium chloride
 . content of hydroxypropyl group: 0
 . degree of substitution: 0.1

Key: 1 Ingrédients
 2 INCI name
 3 wt%
 4 Sodium lauryl ether (2EO) sulfate
 5 Cocamidopropyl betaine
 6 Sodium cocamphoacetate



Key: 1 Products

Formulation 11 containing guar hydroxypropyltrimonium chloride (that is, not hydroxyalklenated) even precipitates in the absence of an amphoteric surface-active agent.

Example 5: Comparative (synthetic polymers that are not polysaccharides)

The following formulations are prepared traditionally (final pH 6). The amounts are expressed in percentage of active material.

Ingédients ①	② Nom INCI	Formulation		
		3	12	13
Empicol ESB/3M ③ (% poids)	④ Sodium lauryl éther (2EO) sulfate	7	7	7
Tegobetaïne L7 (% poids)	⑤ Cocamidopropyl bétaine	2	2	2
Miranol Ultra C32 (% poids)	⑥ Sodium cocoamphoacétate	1	1	1
Jaguar C162 (% poids)	hydroxypropyl guar hydroxypropyl trimonium chloride	0.3	0	0
Mirapol 550 * (% poids)	Polyquaternium 7	0	0.3	0
Mirapol A15 ** (% poids)	Polyquaternium 2	0	0	0.3
Transmittance ⑦ (% à 600 nm)		100	100	100

*Mirapol 550: obtained by polymerization of acrylamide and dimethyl diallyammonium chloride

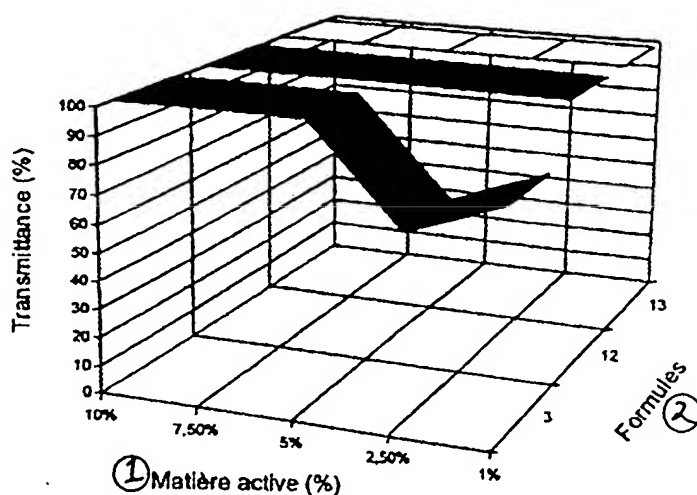
**Mirapol A15: obtained by condensation of bis(chloroethyl ether) with urea and N,N-dimethylpropanediamine.

Key: 1 Ingrédients
 2 INCI name
 3 wt%
 4 Sodium lauryl ether (2EO) sulfate
 5 Cocamidopropyl betaine
 6 Sodium cocamphoacetate
 7 Transmittance (% at 600 nm)

The formulations (formulas) of the preceding table containing approximately 10 wt% of dry extract are diluted by increasing amounts of water; the transmittance of the diluted formulations is measured by means of a Jasco 7800 spectrophotometer.

The following graph shows the change in transmittance as a function of the concentration of active material.

It is noted that the formulations containing Mirapol 550 and Mirapol A15, cationic polymers that are not derived from polysaccharides, do not precipitate upon dilution.



Key: 1 Active material
2 Formulas

Example 6: Sensory analysis

The following formulations are prepared traditionally (final pH 6). The amounts are expressed in percentage of active material.

Ingédients ①	Nom INCI ②	Formulation	
		1	3
Empicol ESB/3M ③ (% poids)	Sodium lauryl éther (2EO) sulfate ④	8	7
Tegobétaïne L7 (% poids)	Cocamidopropyl bétaine ⑤	2	2
Miranol Ultra C32 (% poids)	Sodium cocoamphoacetate ⑥	0	1
Jaguar C162 (% poids)	hydroxypropyl guar hydroxypropyl trimonium chloride	0.3	0.3
Transmittance à 10% actif ⑦ (% à 600 nm)		100	100
Transmittance à 2,5% actif ⑧ (% à 600 nm)		100	40

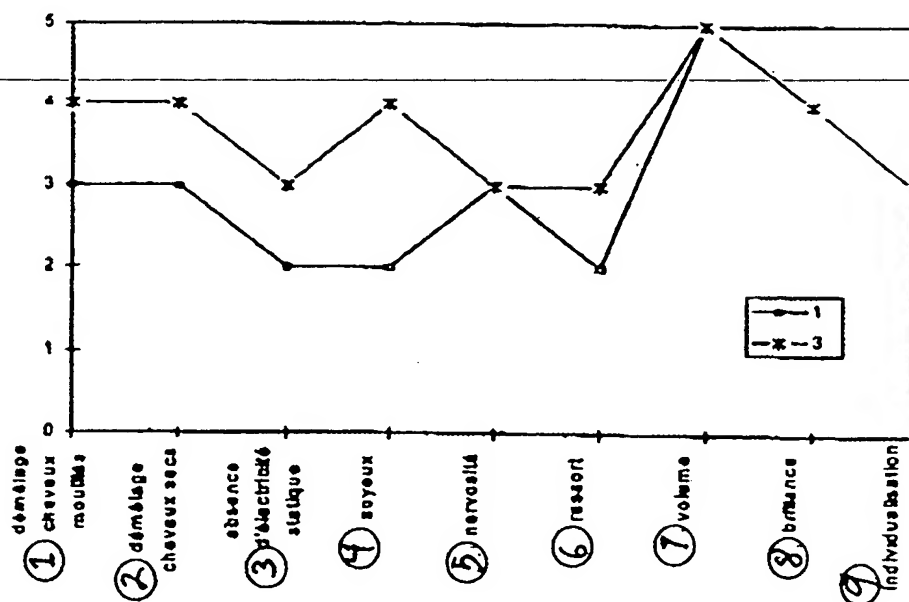
- Key:
- 1 Ingrédients
 - 2 INCI name
 - 3 wt%
 - 4 Sodium lauryl ether (2EO) sulfate
 - 5 Cocamidopropyl betaine
 - 6 Sodium cocamphoacetate
 - 7 Transmittance with 10% active product (% at 600 nm)
 - 8 Transmittance with 2.5% active product (% at 600 nm)

These formulations are evaluated by sensory analysis (panel of 25 judges)

The 7 locks of hair (European hair) are previously pretreated by a solution of lauryl sulfate (5%) for 1 h. The locks are then rinsed with water, and then dried.

The locks of hair are next washed with 0.7 g of formulation for 30 sec, and then rinsed for 45 sec. The locks of hair are then put on rollers, and then dried.

The results of evaluation are given in the following graph.



- Key:
- 1 Untangling wet hair
 - 2 Untangling dry hair
 - 3 Absence of static electricity
 - 4 Silkiness
 - 5 Liveliness
 - 6 Springiness
 - 7 Volume
 - 8 Shine
 - 9 Individualization

The phenomenon of controlled precipitation makes it possible to improve the untangling, the absence of static electricity and the silkiness.

Example 7: Deposit increase

The following formulations are prepared traditionally (final pH 6). The amounts are expressed in percentage of active material.

Ingédients ①	Nom INCI ②	Formulation	
		1	3
Emplcol ESB/3M (% poids) ③	Sodium lauryl éther (2EO) sulfate ④	8	7
Tegobetaine L7 (% poids)	Cocamidopropyl bétaine ⑤	2	2
Miranol Ultra C32 (% poids)	Sodium cocoamphoacetate ⑥	0	1
Jaguar C162 (% poids)	hydroxypropyl guar hydroxypropyl trimonium chloride	0.3	0.3
Rheozan (% poids)	Succinoglycan gum	0.1	0.1
Mirasil DME-30 (% poids)	Dimethicone emulsion (+) succinoglycan gum	2	2

Key: 1 Ingredients
 2 INCI name
 3 wt%
 4 Sodium lauryl ether (2EO) sulfate
 5 Cocamidopropyl betaine
 6 Sodium cocoamphoacetate

Locks of European hair (4 g) are previously rinsed, then treated with a solution of lauryl sulfate (10%) for 60 sec. The locks of hair are then rinsed for 60 sec. This operation is repeated twice.

The locks of hair are next washed with 0.25 g of formulation for 30 sec, and then rinsed for 60 sec.

The locks of hair are next air-dried for 1 h.

The amount of silicone deposited is measured after alcoholysis of the polymer deposited and the measurement of the volatile residues by gas chromatography.

The results are expressed in yield of deposit.

The yield of deposit of Formulation 1 is 4%, that of Formulation 3 is 8%.

The presence of a small amount of amphoteric surface-active agent therefore makes it possible to double the amount of silicone deposited on the hair.

Example 8: Conditioning shampoo

The amounts are expressed in percentage of product as is.

Ingrédients (1)	Nom INCI (2)	% poids (3)
Empicol ESB/3M	Sodium lauryl ether sulfate (4)	25
Tegobetaine L7	Cocamidopropyl betaine (5)	6,7
Miranol Ultra C32	Sodium cocoamphoacetate (6)	3,2
Jaguar C162	Hydroxypropyl guar hydroxypropyl trimonium chloride	0.3
acide citrique (7)	Citric acid	qs pH 6
parfum (8)	Parfum	qs
Conservateur (9)	-	qs
eau (10)	Aqua (10)	qsp 100

- Key:
- 1 Ingredients
 - 2 INCI name
 - 3 wt%
 - 4 Sodium lauryl ether (2EO) sulfate
 - 5 Cocamidopropyl betaine
 - 6 Sodium cocamphoacetate
 - 7 Citric acid
 - 8 Fragrance
 - 9 Preservative
 - 10 Water

Procedure

Disperse the Jaguar C162 in water and hydrate with citric acid. Add the Miranol Ultra C32, the Tegobetaine L7, and then the Empicol ESB3/M with agitation. Adjust the pH with the citric acid to 6.5.

Example 9: Transparent shower gel

The amounts are expressed in percentage of product as is.

Ingrédients (1)	nom INCI (2)	% poids (3)
Jaguar C162	hydroxypropyl guar hydroxypropyl trimonium chloride	0,2
Mirasil ADM-E	Amodimethicone (and) trideceth-6	2
Miranol Ultra C32	Sodium cocoamphoacetate	14
Emplcol ESB3/M	Sodium laureth sulfate	34
Mirataine CBS	Cocamidopropyl hydroxy sultaine	3
conservateur (4)	-	qs
parfum (5)	parfum	0,2
Tween 20	Polysorbate 20	0,2
acide citrique (6)	citric acid	2,3
chlorure de sodium (7)	sodium chloride	qs
eau (8)	aqua (8)	qs 100

Key:	1	Ingredients
	2	INCI name
	3	wt%
	4	Preservative
	5	Fragrance
	6	Citric acid
	7	Sodium chloride
	8	Water

Procedure

Disperse the Jaguar C162 in water and hydrate with citric acid. Add the other ingredients under agitation and in the order given. Adjust the pH to 6.5 with citric acid.

Example 10: Shower gel

The amounts are expressed in percentage of product as is.

Ingédients ①	Nom INCI ②	% poids ③
Empicol ESB/3M	Sodium lauryl éther sulfate ④	25
Tegobetaine L7	Cocamidopropyl bétaine ⑤	6.7
Miranol CSE	Sodium cocoampho hydroxypropyl sulfonate	3,2
Polymer JR400	Polyquaternium-10	0.3
acide citrique ⑥	Citric acid	qs pH 6
parfum ⑦	Parfum	qs
Conservateur ⑧	-	qs
eau ⑨	⑨ Aqua	qs 100

- Key:
- 1 Ingredients
 - 2 INCI name
 - 3 wt%
 - 4 Sodium lauryl ether (2EO) sulfate
 - 5 Cocamidopropyl betaine
 - 6 Citric acid
 - 7 Fragrance
 - 8 Preservative
 - 9 Water

Procedure

Disperse the JR400 Polymer in the water and add the Miranol CSE, the Tegobetaine L7, and then the Empicol ESB3/M under agitation. Adjust the pH to 6.5 with the citric acid.

Claims

1. Use in transparent aqueous cosmetic compositions for the hair and/or skin intended to be rinsed, of at least one amphoteric surface-active agent (A) in an amount on the order of 0.5 to 10 wt%, preferably on the order of 0.5 to 3 wt% by comparison with the weight of said cosmetic

compositions, as precipitating agent, upon dilution during the application of said compositions on the hair and/or skin, of a water-soluble or water-dispersible derivative of a polysaccharide (CPol), said transparent aqueous cosmetic compositions containing at least 90 wt% of an

aqueous phase (Φ) containing from 8 to 20 wt% of a system (S) formed of at least one anionic surface-active agent (SAn), at least one surface-active agent chosen from the betaines (SB) and at least one water-soluble or water-dispersible cationic polymer derived from a polysaccharide (CPol), the respective amounts of the constituents (SAn), (SB) and (CPol) and the nature of the cationic polymer (CPol) in said system (S) being such that the aqueous phase (ϕ) formed from said system (S) in aqueous solution at a concentration from 8 to 20% has a transmittance measured at 600 nm at least equal to 90% and does not have any phase separation behavior with formation of precipitate upon dilution.

2. Use according to Claim 1, characterized in that said aqueous phase (Φ) contains:

- on the order of 5 to 15 wt%, preferably on the order of 8 to 12 wt% of at least one anionic surface-active agent (SAn)
- on the order of 0.5 to 10 wt%, preferably on the order of 0.5 to 3 wt% of at least one surface-active agent chosen from the betaines (SB)
- and on the order of 0.015 to 2 wt%, preferably on the order of 0.05 to 0.5 wt% of at least one cationic polymer (CPol).

3. Use according to Claim 1 or 2, characterized in that said cationic polymer (CPol) is chosen from cationic derivatives of cellulose and hydroxyalkylated derivatives of cationic guar.

4. Use according to Claim 3, characterized in that said cationic polymer (CPol) is hydroxypropyl guar hydroxypropyltrimonium chloride or propyl cellulose 2-hydroxy-3-trimethylammonium chloride poly(oxy-1,2-ethanediyl) ether.

5. Use according to any one of Claims 1 to 4 characterized in that said anionic surface-active agent (SAn) is chosen from alkyl ester sulfonates, alkyl sulfates and their oxyethylenated and/or propoxylenated derivatives, alkylamide sulfates, and their oxyethylenated and/or propoxylenated derivatives, or salts of saturated or unsaturated fatty acids.

6. Use according to any one of Claims 1 to 5, characterized in that said surface-active agent (SB) is chosen from betaines, sulfobetaines, or amidoalkylbetaines.

7. Use according to any one of Claims 1 to 6, characterized in that said amphoteric

surface-active agent (A) is chosen from alkyl or alkenyl amphotoacetates or amphodiacetates, alkyl amphopropionates or dipropionates, or alkyl amphohydroxypropyl sultaines, in which the alkyl groups contain from 8 to 24 carbon atoms.

8. Use according to any one of Claims 1 to 7 of said amphoteric surface-active agent (A) in said cosmetic compositions containing in addition at least one organic water-insoluble compound (OPins) as precipitating agent of said cationic polymer (CPol) and as depositing agent of particles of said organic water-insoluble compound (OPins) upon dilution.

9. Use according to Claim 8, characterized in that organic water-insoluble compound (OPins) is present in said compositions at 0.1 to 10%, preferably at 0.2 to 2 wt%.

10. Use according to Claim 8 or 9, characterized in that said organic water-insoluble compound (OPins) is chosen from water-insoluble and nonvolatile organopolysiloxanes, oils exerting conditioning, protective and emollient functions, bactericidal or fungicidal agents, sunscreens.

11. Transparent aqueous cosmetic compositions for the hair and/or skin intended to be rinsed, containing:

*at least 90 wt% of an aqueous phase (Φ) containing:

- at least one amphoteric surface-active agent (A) in an amount on the order of 0.5 to 10 wt%, preferably on the order of 0.5 to 3 wt% by comparison with the weight of said cosmetic compositions,
- and 8 to 20 wt% from a system (S) formed from at least one anionic surface-active agent (SAn), of at least one surface-active agent chosen from betaines (SB) and at least one water-soluble or water-dispersible cationic polymer derivative of a polysaccharide (CPol), the respective amounts of the constituents (SAn), (SB) and (CPol) and the nature of the cationic polymer (CPol) in said system (S) being such that the aqueous phase (ϕ) formed from said system (S) in aqueous solution at a concentration from 8 to 20% has a transmittance measured at 600 nm at least equal to 90% and does not present any phase separation behavior with formation of precipitate upon dilution,

said aqueous phase (ϕ) in the presence of said amphoteric surface-active agent (A), presenting upon dilution, a phase separation behavior with formation of a precipitate,

* and optionally at least one organic water-insoluble compound (OPins).

12. Composition according to Claim 11, characterized in that said aqueous phase (Φ) contains:

- on the order of 5 to 15 wt%, preferably on the order of 8 to 12 wt% of at least one anionic surface-active agent (SAn)
- on the order of 0.5 to 10 wt%, preferably on the order of 0.5 to 3 wt% of at least one surface-active agent chosen from betaines (SB)
- and on the order of 0.015 to 2 wt%, preferably on the order of 0.05 to 0.5 wt% of at least one cationic polymer (CPol).

13. Compositions according to Claim 11 or 12, characterized in that said cationic polymers (CPol), surface-active agents (SAn), (SB) and (A) and the optional water-insoluble organic compounds (OPins) are chosen from those mentioned in Claims 3, 4, 5, 6, 7 or 10.

14. Compositions according to any one of Claims 11 to 13, characterized in that in addition they contain at least one additive chosen from fixative resins, polymers exerting a protective action, plasticizing agents, metal sequestering agents, moisturizers, water-soluble or water-dispersible polymers, preservatives, fragrances, coloring agents, pigments, thickening or gelling polymers, or polymeric dispersing agents.

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